Emergency Department Crowding
Information Paper

Introduction

Emergency department (ED) crowding has become an issue affecting emergency physicians and the departments in which they function across the US. The reasons behind the current crowding phenomenon are complex and multi-factorial. This paper will addresse the current causes of ED crowding, evaluate our current understanding of ED crowding, and suggest approaches that individual groups may utilize within their institutions and ED practices to deal with such crowding.

Definition

The ACEP Crowding Resources Task Force adopted the following definition of ED crowding:[1] *"A situation in which the identified need for emergency services outstrips available resources in the ED. This situation occurs in hospital EDs when there are more patients than staffed ED treatment beds and wait times exceed a reasonable period. Crowding typically involves patients being monitored in non-treatment areas (eg, hallways) awaiting ED treatment beds or inpatient beds. Crowding may also involve an inability to appropriately triage patients, with large numbers of patients in the ED waiting area of any triage assessment category."*

ED crowding is a *system* problem not an ED problem. One can look at ED crowding from two perspectives:

1. Macro level – This perspective examines the forces of the national and regional levels that drive ED crowding, such as the federal and state government health programs, and other regulatory bodies.
2. Micro level – This three phase perspective examines the forces that affect EDs on a local and institutional level. Asplin, et al,[2] developed a conceptual model of ED crowding:
    - Input
    - Throughput
    - Output

Macro Analysis

Emergency departments in the US are affected by powerful economic forces and special interests impacting the health care system. These include health care funding by federal government, state governments, and the private health insurance industry, as well as demand for care and demographic trends. The following six factors significantly affect ED crowding:

1. Demographic Trends – Some of the demographc trends include increases in the population, reduction in the number of EDs in the US, aging of the population, lower inpatient bed capacity as well as the increasing complexity and acuity of patients. Patients are simply older and sicker, with EDs universally seeing a higher proportion of seriously ill and injured patients.[3]

2. Government Health Care Policy – Cuts in funding to physicians and hospitals have led to diminished inpatient capacity. A recent General Accounting Office (GAO) study[4] on ED crowding found that the major cause of ED crowding was inpatient boarders taking up beds in the emergency room. An increasing demand for health care combined with reduction in reimbursement and capacity have led to a great imbalance between the demand for health care and the provider's ability to meet that demand.

3. EMTALA – This national unfunded mandate has constrained emergency physicians' and their institutions' abilities to deliver appropriate care and, at times, to obtain appropriate specialist coverage.

4. Technology – EDs are seeing increasing referrals from outside physicians and clinics who recognize that emergency physicians can diagnose complex medical problems and have timely access to rapid diagnostic technology.

5. Health Care Trends – Economic pressure by the federal government and managed health care as well as the accompanying industry consolidation has resulted in a contraction of both inpatient beds, as well as a reduction in the total number of EDs in the US. Between 1992 and 1999, 10% of the acute care hospitals in the US closed. From 1992 to 2003, ED visits in the US increased by 20% from 89.9 million to 108 million.[5] Such reductions when coupled with a national nursing shortage have created a situation where hospitals are operating at near-capacity, removing whatever buffer the system had, previously, to respond to relatively small increases in demand.

6. The Uninsured – The continued increase in the number of uninsured, who often have nowhere else to turn but the ED, places additional stress on the system. Reports from the GAO and Institute of Medicine (IOM) provide evidence of an increase in ED crowding in areas with greater numbers of uninsured patients.[6]

Micro Analysis

Input

The input component at the micro level of analysis includes "any condition, event, or system characteristic that contributes to the demand for ED services." Asplin, et al, recognized three main categories of care delivered in the ED: emergency care, unscheduled urgent care, and safety net care. Reduction in the number of patients in any of these categories would lead to an overall reduction in ED crowding. On the other hand, reduction of numbers is not the only way to resolve of the crowding problem. Another approach is to improve capacity to handle the volume.

In 1997, several EDs began reporting crowding problems. In 1999, many more EDs reported crowding. That year marked the beginning of emergency medical services (EMS) ambulance diversions. One factor to assess when considering the input component is the contribution of EMS to the ED volume. David E. Persse, MD, FACEP, medical director of the Houston Fire Department, studied the effect of hospital diversion in Houston, Texas, on ED volume, ED length of stay, and on the number of ED patients who left without treatment. Data were collected from October 2002 through October 2003. His results did not indicate any correlation between any of these factors and the percentage of time on diversion. Being on diversion did not appear to significantly decrease volume or decrease length of ED stay or decrease the number of patients who left without treatment. Yet hospital EDs are going on diversion an increasingly greater percentage of time, increasing hardship to EMS services that attempt to comply with the diversion requests. Persse's data would suggest that diversion does not appear to be an effective means to reduce ED crowding.

According to Eugene Litvak, PhD, from Boston University School of Management and Harvard School of Public Health, the single most important factor contributing to ED diversion is the daily variability in the operating room (OR) elective surgical caseload. A 2002 Root Cause Analysis of Massachusetts EDs[7] showed that there was a minimal relationship between diversion and patient arrivals (diversion did little diverting), and between diversion and ED volume (high ED volumes did not seem to contribute to

diversion). The authors found ED census did not affect diversion, and diversion had little impact on ED turn around times (TATs). They did find that ED boarders strongly correlated with diversion, as did scheduled admissions. Interestingly, they also found that the ED admissions were more predictable than the scheduled admissions.

The medicolegal climate also makes it difficult to reduce volume in the input component, as does increased information to the public about all sorts of potential emergencies, such as heart attacks, strokes, meningitis, West Nile virus, and even flu. The taped message received when calling almost every physician's office when closed tells patients to call 911 or go to the ED if they think they might have an emergency condition. Patients are increasingly told to go to the ED, even during office hours if they call when the office is busy or if they call with a problem that could require admission (eg, chest pain). Another reason for unscheduled urgent care is that a portion of these patients simply prefer coming to the ED despite the wait, because it is more convenient to do so than to schedule around their work and family duties to see a primary care physician during office hours.

The safety net care portion of the ED input component involves populations, primarily Medicaid-covered patients and the uninsured, who have barriers to care such as financial, transportation, and source-of-care limitations. ED crowding has been reported by the Institute of Medicine (IOM) and the GAO to be more severe in communities with higher numbers of uninsured (or underinsured) residents.

Throughput

The throughput component, at the micro level perspective, includes the patient length of stay in the ED as a potential contributing factor to ED crowding. Asplin, et al, divided the throughput component into two phases: a first phase, consisting of triage, room placement, and initial provider evaluation; and a second phase consisting of testing and treatment. There are two additional steps in an ED patient encounter not addressed in Asplin's analysis, ie, registration and disposition, so that the sequence would be: triage, bed placement, physician evaluation, diagnostic tests, treatment, and disposition - with registration inserted somewhere along the way. There are a number of obstructions and obstacles that potentially could interfere with this step-wise process and thereby contribute to intradepartmental ED crowding (ED crowding as a result of intrinsic ED process failures).

The triage process has almost as many variations as there are hospitals, suggesting that a best practice at this step is elusive. In the case of the critically ill, triage is followed by immediate ED team management; this is rarely compromised by ED crowding.

Once ED bedded, emergency patients have fewer obstructions to obtaining care attributable to ED resource limitations. ED physician staffing patterns are variable and highly dependent on acuity, hospital efficiency, payer mix, location, and physician supply and demand issues. The typical range (assuming adequate volume) is 1.8 to 2.5 patients per provider hour.

Once seen, most ED patients undergo testing and treatment. Efficiencies of the laboratory, X-ray, special studies, case management, and ED nursing are critical to rapid ED throughput. ED boarded inpatients have a negative effect as well, as they will continue to consume physician, nurse and ancillary resources in addition to occupying physical space. And, as ED inpatient boarders increase, ED critical care inevitably will become more difficult to manage, due to both physical resource limitations (no room) and, more importantly, personnel resource limitations. For example, if an ED nurse is taking care of critical care boarders, then the addition of more critical patients creates an environment of increased risk. Other factors, such as the relative or absolute non-availability of one or more on-call specialties, language barriers, and nursing shortages contribute to increased difficulties in ED throughput as well.

Once testing and treatment is complete, the patient either goes home or stays in the hospital as an inpatient or observation patient. The GAO report identified that a significant cause of ED boarders was due to the competition between elective admissions and ED admissions, and noted that elective admission diagnoses generate more revenue than ED admissions even if all patients are funded.[4] In the case of ED overcrowding due to hospital crowding, the patients board in the ED, further restricting capacity and exacerbating the mismatch between the staffed capacities of the ED. This creates the compelling paradoxical business option of sending ED providers home early despite an "overcrowded" ED.

In many hospitals, EDs contribute 40-50% of all hospital admissions, making the ED the largest single source of hospital admissions. Furthermore, the ED in a large hospital is a multimillion dollar a year enterprise that, in many cases, is responsible for the financial viability of the entire hospital (which is not unusually a hundred million dollar-plus a year enterprise). It can be made more risky by adding new or temporary (agency) employees who lack the special training required due to the uniqueness of that particular hospital ED's mix of policies, procedures, and personalities.

The most critical management tool in reducing length of stay in any ED is measurement. With frequent and critical analysis of the goal(s) of the metrics chosen, permanent measurement systems should be put in place. Every measurement, and each measurement tool, has to be placed in an environment (usually an empowered committee) where change can be instituted. Change in an ED always will be constant and subject to multiple sources of influence. These sources of influence include community expectations, medical staff expectations, administration expectations, finances, federal, state, and local laws, changes in medical care, changes in pharmacodynamics, and so on. To address decreased throughput times, decreasing ED bed occupancy time, and therefore, increasing bed and intrinsic ED capacity, measurements should include:

- Arrival to triage
- Triage to bed placement
- Bed to doctor
- Doctor to disposition
- Disposition to leaving
- Key lab Turn-around-times (TATs)
- Key imagery studies TATs

This process of measurement should be automated as much as possible and become part of the culture of the department. A tracking tool, computer driven, greatly facilitates data gathering and should be sought to replace the far less useful yet more prevalent technology of the past century (ie, the grease board). All charting tools need to be simple, fast, easy, and to focus on risk management in order for them to not contribute to intradepartmental delays.

Output

The output component, at the micro level of analysis, primarily involves disposition of ED patients.

Admissions to the Hospital

According to the National Hospital Ambulatory Medical Care Survey by the Centers for Disease Control and Prevention (CDC), in 2001 the percentage of patients presenting to the ED, who are then admitted to the hospital averaged 11.7 percent.[5] This percentage may be higher at an individual hospital, depending upon the patient population, as well as higher levels of uninsured patients, who

tend to wait longer before seeking medical care and are in more need of admission due to advanced illness.

The number of hospital beds has steadily declined throughout the 1990s and early 21st century, even while the number of ED visits and hospital admissions has increased. The number of hospital beds cannot be expeditiously or inexpensively increased, therefore the number of beds currently in the system must be used more efficiently. In essence, admitted length of stay must be decreased so that capacity can be increased. Given no increase in the number of beds, the following issues should be addressed.

- **Staffing of Nurses for Inpatient Beds**

  The staffing of beds has been a pressing issue with the national nursing shortage. The recruitment and retention of nursing is exceedingly important in keeping the maximum number of beds open in any given institution. This also needs to be addressed at a national level through lobbying efforts not only by the Emergency Nurses Association (ENA) and the American Nurses Association (ANA), but also by physician organizations.

- **Test Turn-around-time (TAT)**

  Often the decision to discharge a patient from their inpatient or observation stay is contingent on the results of a test or tests. Some have advocated for (and are using) centralized/computerized X-ray, CT, and MRI ordering - which gives clinicians more control over testing times and allows for better planning of care. Improving in-house test TATs will make the entire system more efficient.

- **Discharge Lounges/Inpatient Hallways**

  Patients who are boarded and waiting for a hospital bed or those patients that line the ED hallways and waiting rooms as yet unseen by a physician are certainly less stable than patients who are discharged but continue to occupy a hospital bed. To this end, a number of hospitals have employed the concept of discharge lounges for patients awaiting discharge so that a bed is made available for an admitted patient. In some hospitals, boarded patients are shifted from the ED hallway to the inpatient hallway. This has exposed inpatient units to the pressures formerly contained solely within the ED and allows them to appreciate, firsthand, the reality of the crowding problem, perhaps encouraging timelier discharges.

- **Advanced Discharge Planning/Bed Czar**

  Many hospitals have employed the use of teams composed of utilization review staff, social workers and physicians/nurses (bed czar model) to assess inpatient bed utilization and help plan timelier discharges on difficult-to-place patients as well as identifying which patients could be discharged the next day and making the necessary arrangements. Bed czars are often given the authority to transfer patients, discharge patients, expedite testing, cancel or put a hold on elective admissions/procedures.

- **Bed TAT**

  Rapid bed turn-around-time is essential to reducing the admission cycle times. Admission orders need to be addressed as soon as they are written. Patient transport needs to be made aware of the need to transport a patient and be available rapidly. Once the bed has been vacated, the cleaning process should be expedited and bed-board updated once the bed is available for the next patient. This requires time measurements, as well as accountability of housekeeping and transport staff.

- **Elective admissions**

  Some studies have demonstrated that elective admissions for cardiac and surgical procedures are related to decreased hospital capacity for urgent/emergent admissions. Thus, in turn, is related to increased ED crowding, as well as an increase in the number of patients that leave without being seen, and an increase in ambulance diversion. Hospital administration often perceives elective admissions as being more lucrative, from a bottom line standpoint, than are implementing methods to reduce overcrowding.

- **Physician Staffing/Hospitalist**

  As discharges occur more frequently in early daytime as well as evening, there is an increased strain on traditional office practitioners - who round once-a-day to meet the needs of inpatient medicine. Hospital medical staffs have moved to mandating timeliness of patients being seen by primary care doctors as well as consultants, upon admission, so that the time lag between admission and orders being enacted is minimal. The advent of the hospitalist movement has taken hold in many communities. Numerous studies have shown that hospitalists effectively decrease the length of stay without compromising quality of care.[8]

Physical Capacity

Ultimately, if crowding continues to exist despite improved efficiencies, physical capacity of EDs and hospitals must be increased. This takes a significant amount of time and money. Hospitals have added express admission units to help patient flow out of the ED and to get patients' admission orders started in a timely fashion, while they wait for the appropriate bed to become available. Some EDs have successfully used observation units as either decision units or "holding tanks."

Ambulatory Care System

Outpatient services provide both primary health care as well as subspecialty care to patients. The numbers of young physicians going into the primary care field has consistently declined. At the same time, the number of uninsured Americans has increased.[9] This has led to an increasing number of patients seeking ED care; the ED has become the "safety net."

Skilled Nursing Facility (Nursing Homes)

The American population is aging at an increasing rate. Consequently, the population of admitted patients are increasingly, on Medicare and in need of nursing home placement. Medicare pays for

only a few months of acute nursing home care, and then, only after a three-day mandatory evaluation in the hospital - which is often not clinically needed. It has become harder to place patients into nursing homes, due to lack of skilled nursing facility (SNF) capacity and staffing availability constraints.

Conclusions and Opportunities for Action

Emergency department crowding is a symptom of systems issues, at both the macro and micro levels. Although individual physicians or groups cannot be expected to greatly influence national health care policy, they can advocate for their patients at both the national and state level by involvement in organizations such as ACEP as well as by writing and talking to national, state, and local politicians and other policymakers. Opportunities for physician involvement:

1. Build coalitions with other groups with similar stakes in the healthcare system.
2. Pursue legal rights to reasonable payment for services.
3. Establish policies to limit or discourage the existence of ED boarding.
4. Advocate for appropriate funding for the EMTALA mandate.
5. Convey the following messages to policy makers:
   a. The ED crowding problem is a *systems* problem, *not* just an ED problem. The problem reflects issues at the institutional level (micro) and at the national policy level (macro).
   b. The ED crowding problem affects *everyone*, including the insured.
   c. Quality may be compromised if the necessary resources are not recognized and funded appropriately.
   d. Hospital, as well as ED crowding undermine national and local emergency preparedness.

Created by members of the Emergency Medicine Practice Subcommittee on Crowding
March 2004

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Reviewed by the ACEP Board of Directors, April 2004

References

1. ACEP Crowding Resources Task Force. *Responding to Emergency Department Crowding: A Guidebook for Chapters.* Dallas, TX: American College of Emergency Physicians; 2002.
2. Asplin, BR, et al. A Conceptual Model of Emergency Department Crowding. *Ann Emerg Med*. 2003; 42:173-180.
3. Lambe S. Washington DL, Fink A, et al. Trends in the use and capacity of California's emergency departments, 1990-1999. *Ann Emerg Med*. 2002; 39:389-396.
4. General Accounting Office. Hospital Emergency Departments: Crowded Conditions Vary Among Hospitals and Communities. Washington, DC: General Accounting Office; 2003; p. 22.
5. McCaig LF, Ly N. National hospital ambulatory medical care survey: 2000 emergency department summary. Advance data from vital statistics; no. 326. Hyattsville, MD: National Center for Health Statistics. 2003.
6. Institute of Medicine, Committee on the Consequences of Uninsurance. A Shared Destiny: Community Effects of Uninsurance. Washington, DC: The National Academies Press; 2003.
7. Litvak E, McManus M, Cooper A. "Root Cause Analysis of Emergency Department Crowding and Ambulance Diversion in Massachusetts." A report submitted by the Boston University Program for the Management of Variability in Health Care Delivery under a grant from the Massachusetts Department of Public Health, October 2002.
8. Wachter RM. The Benefits of Using Hospitalists. *Health Forum J.* 2001; 44(4):34-36.
9. Health Challenges Facing the Nation. Statement before the Joint Economic Committee, United States Congress. Kaiser Family Foundation. October 1, 2003.